DOCUMENT RESUME

ED 170 460 CE 018 658

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TITLE	Distributive Education. Mathematics. Instructor's Curriculum.
INSTITUTION	Missouri Univ., Columbia. Instructional Materials Lab.
REPORT NO	DE-27-I
NOTE	60p.; For related documents see CE 018 651-660 ; Parts may not reproduce clearly due to colored background
AVAILABLE FROM	Midwest Regional Center, State Department of Vocational & Technical Education, 1515 West Sixth Avenue, Stillwater, Oklahoma 74074
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Behavioral Objectives; *Business Skills; *Distributive Education; *Instructional Materials; Job Skills; *Learning Activities; *Mathematical Applications; *Mathematical Concepts; Payroll Records; Performance Based Education; Secondary Education; Taxes

ABSTRACT

Eight lesson plans on mathematics are presented in this performance-based curriculum unit for distributive education. This unit is self-contained and consists of the following components: introduction (provides overview of unit content and describes why mastery of the objectives is important); performance objectives; pre-assessment instrument (with answer key); and unit outline (table of contents, time required for unit, and materials and resources needed). Lesson plans generally include student information sheets, assignment sheets, and teacher materials (e.g., transparency masters). Lesson plan topics include rounding off numbers, decimals, percentages, figuring salaries, commissions, figuring sales tax, and discounts. The unit also contains a post-assessment with answer key related to the enabling objectives and a unit evaluation. (CT)

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DE - 27 - I

Mathematics

INSTRUCTOR'S

curriculum

distributive education

CE 018 658

INSTRUCTIONAL
MATERIALS
LABORATORY

IML

10 INDUSTRIAL EDUCATION BUILDING
UNIVERSITY OF MISSOURI-COLUMBIA

MATHEMATICS

Produced by the Instructional Materials Laboratory
University of Missouri-Columbia
Columbia, Missouri
Amon Herd, Director
Catalog Number DE-27-I

ACKNOWLEDGMENTS

Appreciation is expressed to the many individuals who gave their time, knowledge and talents to the development of these materials. Without their cooperation this packet would not have been made possible.

A special thanks is extended to the following persons for:

SUPPORT AND DIRECTION

State Staff, Distributive Education, Department of Elementary and Secondary Education:

Lester Kesterson, Director
Deigh Irwin, Supervisor
Jack Bitzenburg, Supervisor

Distributive Education Staff, University of Missouri:

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LESSON PLAN FORMAT

Introduction and Objectives	Blue
Unit Outline	White
Pre Assessment	Buff
Pre Assessment Key	Grey
Lesson Plans	Yellow
Information Sheets	Pink
Assignment Sheets	Green
Transparency Masters	White
Key and Answer Sheets	Grey
Teacher Reference Sheets	Blue
Optional Activities and Bibliography	White
Post Assessment	Buff
Post Assessment Key	Grey
Unit Evaluation	Buff

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INTRODUCTION

Math is a necessary tool in the business world. It is used by virtually every individual each day of his or her life, and the person who does not have the basic math skills is severely handicapped. This unit of instruction will provide skill building drills in adding, subtracting, multiplying and dividing.

The student will learn to figure percents and discounts, determine salaries earned, and complete the change-making activities of a sale.

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OBJECTIVES

Terminal Objective:

9.00 After the student has completed this unit he or she will be able to compute math problems dealing with addition, subtraction, division, multiplication, figuring percents and discounts, and calculating salary as the problems relate to the student's chosen occupation.

Enabling Objectives:

After completion of this unit, the students should be able to:

9.01 Solve problems using the four basic operatives of subtraction, addition, division and multiplication.

9.02 Round off whole numbers to the nearest ten, hundred and thousand.

9.03 Multiply decimals and locate the decimal point correctly in the answers.

9.04 Convert whole numbers to percents.

9.05 Figure a salary given the number of hours worked and the rate per hour.

9.06 Figure a salary when on a fixed rate plus the commission earned during the pay period.

9.07 Figure the sales tax on an item when given the price of the purchase and the tax rate.

9.08 Correctly compute discounts when given the price of an item and amount of percent discount.

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UNIT OUTLINE

I. Time for unit: Eight 55 minute class periods

II. Materials

A. Introduction

B. Objectives

C. Lesson Plan 1

1. Pre-assessment Quiz

2. Pre-assessment Quiz Key

3. Assignment Sheet 1.01 - Skill-Building Drills

4. Assignment Sheet 1.01 Key

5. Transparency Master 1.01 - Math Objectives

D. Lesson Plan 2

1. Information Sheets

a. 2.01 - Rounding Numbers
b. 2.02 - Multiplying Decimals
c. 2.03 - Converting Whole Numbers to Percents

2. Assignment Sheets

a. 2.01 - Rounding Numbers
b. 2.01 - Rounding Numbers Key
c. 2.02 - Multiplying Decimals
d. 2.02 - Multiplying Decimals Key
e. 2.03 - Converting Whole Numbers to Percents
f. 2.03 - Converting Whole Numbers to Percents Key

E. Lesson Plan 3

1. Information Sheets

a. 3.01 - Wage Income
b. 3.02 - Wage Deduction

2. Assignment Sheets

   a. 3.01 - Hourly Wage
   b. 3.01 - Hourly Wage Key
   c. 3.02 - Wage Deduction
   d. 3.02 - Wage Deduction Key

F. Lesson Plan 4

   1. Information Sheet 4.01 - Commissions

   2. Assignment Sheet 4.01 - Commissions

   3. Assignment Sheet 4.01 - Commissions Key

G. Lesson Plan 5

   1. Information Sheet 5.01 - Sales Tax

   2. Assignment Sheet 5.01 - Sales Tax Problems

H. Lesson Plan 6

   1. Information Sheet 6.01 - Discounts

   2. Assignment Sheet 6.01 - Discounts

   3. Assignment Sheet 6.01 - Discounts Key

I. Lesson Plan 7

   1. Post-assessment

   2. Post-assessment Key

J. Lesson Plan 8

   Unit Evaluation

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LESSON PLAN #1

Time for Lesson: 55 minutes

Objective: After completion of this lesson, students should be able to:

9.01 Solve problems using the four basic operations of subtraction, addition, division and multiplication.

Resources:

1. Transparency Master 1.01 - Unit Objectives
2. Pre-assessment Quiz
3. Assignment Sheet 1.01 - Skill-Building Drills

Teacher Activities:

1. Introduce unit by stressing that there are many similarities in the use of math throughout the different areas of distribution. For example, change making, figuring sales tax, figuring wages earned, etc.

2. Discuss Unit Objectives briefly, using Transparency Master 1.01 - Unit Objectives.

3. Explain that before going on, you will give a quiz on elementary math used by most salespeople.

   A. Distribute Pre-assessment Quiz.

   B. Students may need scrap paper to do some of the problems.

   C. Time: approximately 10 minutes.

   D. Discuss correct answers with students. If necessary, explain method of computation for each.

4. Emphasize the necessity for neatness and accuracy when dealing with figures.

   A. To illustrate, place 3 or 4 illegible problems on the chalkboard. See how many different answers the students get.

   i.e.

379	378	138
+ 74	+488	+ 34

(These may be placed on the chalkboard before class and covered with paper until demonstration.)

5. Distribute Assignment Sheet 1.01 - Skill-Building Drills.

   A. Teacher may let students check their own papers, exchange papers with other classmates, or collect and check to be returned at next class meeting.

Student Activities:

1. Discuss Math Unit Objectives with class members and teacher.
2. Take Pre-assessment Quiz.
3. Try to solve addition problems on chalkboard.
4. Complete Assignment Sheet 1.01 - Skill-Building Drills.

Assignment: None

Optional Activities:

1. Student work at board.
2. Use of IDECC Materials.
3. Use other references.

   a. employer materials
   b. published books
   c. printed brochures

4. Guest speakers (employers)

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PRE-ASSESSMENT QUIZ

1. Add

$$\begin{array}{r} 874 \\ 953 \\ 286 \\ 541 \\ +809 \\ \hline \end{array}$$

2. Add

$$\begin{array}{r} \$98.50 \\ 76.00 \\ 48.05 \\ +\ 9.00 \\ \hline \end{array}$$

3. Subtract

$$\begin{array}{r} 86924 \\ -54946 \\ \hline \end{array}$$

4. Subtract

$$\begin{array}{r} 10642 \\ -\ 8955 \\ \hline \end{array}$$

5. Multiply

$$\begin{array}{r} 568 \\ \times 407 \\ \hline \end{array}$$

6. Multiply

$$\begin{array}{r} 87.48 \\ \times\ 32.5 \\ \hline \end{array}$$

7. Divide

$47\overline{)1739}$

8. Divide

$8.95\overline{)3150.40}$

9. Add

$3 + 4\ 5/6 + 2/3 + 3/4 =$

10. Divide

$9.75 \div 58\ 1/2 =$

11. If hats cost $25.65 @ dozen, what will 5 cost? _____

12. How many candy bars selling 2 for 15¢ can you sell a customer for $1.20? _____

13. If the price of caramels is 18¢ for 3/16 of a pound, what is the price per pound? _____

14. Find the total price of these goods.

a. 3 1/5 yards of material @ 85¢ a yard _____

b. 5 1/4 yards of braid at 14¢ a yard _____

c. 27 buttons @ 40¢ dozen _____

d. subtotal _____

e. sales tax (4%) _____

TOTAL BILL _____

15. If a customer hands you a $20 bill to pay for 2 shirts at $3.49 and a hat at $8.25;

a. What is the total cost? (tax is 4%) _____

b. What would be the change? _____

pennies___ nickels___ dimes___ quarters___ dollars__

16. Paul received $72.00 for a 40-hour week. For time worked over his 40 hours he is paid time and a half. If he worked 54 hours last week, how much was his total pay? _____

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PRE-ASSESSMENT QUIZ

KEY

1. 3463
2. 231.55
3. 31978
4. 1687
5. 231176
6. 2843.1
7. 37
8. 352
9. 9.25
10. .16
11. $10.65
12. 16
13. 96¢
14. a. $2.72
    b. 74¢
    c. 90¢
    d. $4.36
    e. $4.53
15. a. $15.83
    b. $ 4.17
    2--pennies, 1--nickel, 1--dime, 4--dollars
16. $109.80

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ASSIGNMENT SHEET 1.01

Skill-Building Drills

A. (1) Add:

1.	2.	3.	4.	5.	6.
16	96	17	34	35	12
94	14	21	25	12	65
71	53	72	51	63	33
39	57	45	18	18	14
65	12	21	61	31	83
15	68	24	11	61	13
				45	82
				12	64
				23	14

7.	8.	9.	10.	11.
33	83	$ 18.09	$ 10.01	$ 1.75
12	27	.78	1.21	16.29
65	12	4.46	15.57	1.25
67	65	12.26	7.75	75.03
43	33	.93	.09	8.42
19	67	.07	30.01	.94
91	43	17.99	9.96	16.05
23	15	1.24	18.72	.59
67	85	8.92	12.48	8.27
		15.55	8.93	13.03

12.
$ 17.26
9.04
40.76
.39
.68
1.39
11.18
18.11
2.76
10.06

(2) Complete the following problem, using horizontal and vertical addition:

10 + 2 + 4 + 6 + 9 + 8 = _____
6 + 9 + 6 + 4 + 1 + 3 = _____
9 + 3 + 8 + 7 + 4 + 9 = _____
7 + 9 + 5 + 10 + 5 + 5 = _____
10 + 4 + 8 + 7 + 6 + 9 = _____
____ + ____ + ____ + ____ + ____ + ____ = _____

B. Subtract:

1. $\begin{array}{r} 75 \\ -\ 56 \end{array}$ 2. $\begin{array}{r} 84 \\ -\ 57 \end{array}$ 3. $\begin{array}{r} 218 \\ -\ 119 \end{array}$ 4. $\begin{array}{r} 983 \\ -\ 656 \end{array}$ 5. $\begin{array}{r} 74 \\ -\ 25 \end{array}$ 6. $\begin{array}{r} 62 \\ -\ 29 \end{array}$ 7. $\begin{array}{r} 111 \\ -\ 79 \end{array}$

8. $\begin{array}{r} 204 \\ -\ 78 \end{array}$ 9. $\begin{array}{r} 4890 \\ -\ 362 \end{array}$ 10. $\begin{array}{r} 365 \\ -\ 209 \end{array}$ 11. $\begin{array}{r} \$4815 \\ -\ 3927 \end{array}$ 12. $\begin{array}{r} \$51,425 \\ -\ 50,535 \end{array}$

13. $\begin{array}{r} \$19,621 \\ -\ 18,146 \end{array}$ 14. $\begin{array}{r} \$6783 \\ -\ 2499 \end{array}$ 15. $\begin{array}{r} \$30,020 \\ -\ 9,999 \end{array}$ 16. $\begin{array}{r} \$75,892 \\ -\ 3,475 \end{array}$

C. Find the product:

1. $\begin{array}{r} 3245 \\ \times\ 6 \end{array}$ 2. $\begin{array}{r} 1203 \\ \times\ 3 \end{array}$ 3. $\begin{array}{r} 2421 \\ \times\ 4 \end{array}$ 4. $\begin{array}{r} 481 \\ \times\ 7 \end{array}$ 5. $\begin{array}{r} 3758 \\ \times\ 6 \end{array}$ 6. $\begin{array}{r} 4256 \\ \times\ 4 \end{array}$

7. $\begin{array}{r} 56 \\ \times\ 54 \end{array}$ 8. $\begin{array}{r} 43 \\ \times\ 79 \end{array}$ 9. $\begin{array}{r} 62 \\ \times\ 92 \end{array}$ 10. $\begin{array}{r} 79 \\ \times\ 86 \end{array}$ 11. $\begin{array}{r} 86 \\ \times\ 68 \end{array}$ 12. $\begin{array}{r} 89 \\ \times\ 59 \end{array}$

13. $\begin{array}{r} 892 \\ \times\ 864 \end{array}$ 14. $\begin{array}{r} 719 \\ \times\ 396 \end{array}$ 15. $\begin{array}{r} 728 \\ \times\ 830 \end{array}$ 16. $\begin{array}{r} 825 \\ \times\ 619 \end{array}$ 17. $\begin{array}{r} 586 \\ \times\ 741 \end{array}$ 18. $\begin{array}{r} 483 \\ \times\ 921 \end{array}$

D. Solve the division problems:

1. $7\overline{)49}$ 2. $3\overline{)813}$ 3. $4\overline{)48}$ 4. $3\overline{)750}$ 5. $5\overline{)830}$

6. $2\overline{)6704}$ 7. $3\overline{)1206}$ 8. $9\overline{)279}$ 9. $29\overline{)8507}$ 10. $62\overline{)7739}$

11. $28\overline{)5212}$ 12. $34\overline{)5950}$ 13. $17\overline{)8364}$ 14. $71\overline{)18,318}$

15. $43\overline{)10,965}$ 16. $56\overline{)7616}$ 17. $92\overline{)30,084}$

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ASSIGNMENT SHEET 1.01 KEY

A. (1)

1. 300
2. 300
3. 200
4. 200
5. 300
6. 380
7. 420
8. 430
9. $80.29
10. $114.82
11. $141.62
12. $111.66

A. (2) 193

B. 1. 19
2. 27
3. 99
4. 327
5. 48
6. 33
7. 32
8. 126
9. 4,528
10. 156
11. $888
12. $890
13. $1,475
14. $4.284
15. $20,021
16. $72,417

C. 1. 19,470
2. 3,690
3. 9,684
4. 3,367
5. 22,548
6. 17,024
7. 3,024
8. 3,397
9. 5,704
10. 6,794
11. 5,848
12. 5,251
13. 770,688
14. 284,724
15. 604,240
16. 510,675
17. 434,226
18. 444,843

D. 1. 7
2. 271
3. 12
4. 250
5. 166
6. 3352
7. 402
8. 31
9. 295 R 15
10. 124 R 51
11. 186 R 4
12. 175
13. 492
14. 258
15. 255
16. 136
17. 327

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MATH OBJECTIVES

Terminal Objective:

9.00 After the student has completed this unit he or she will be able to compute math problems dealing with addition, subtraction, division, multiplication, figuring percents and discounts, and calculating salary as the problems relate to the student's chosen occupation.

Enabling Objectives:

After completion of this unit, the students should be able to:

9.01 Solve problems using the four basic operatives of subtraction, addition, division and multiplication.

9.02 Round off whole numbers to the nearest ten, hundred and thousand.

9.03 Multiply decimals and locate the decimal point correctly in the answers.

9.04 Convert whole numbers to percents.

9.05 Figure a salary given the number of hours worked and the rate per hour.

9.06 Figure a salary when on a fixed rate plus the commission earned during the pay period.

9.07 Figure the sales tax on an item when given the price of the purchase and the tax rate.

9.08 Correctly compute discounts when given the price of an item and amount of percent discount.

9.09 Demonstrate the ability to receive overpayment of a purchase and count back the proper amount of change to a customer.

9.10 Balance cash drawers against register readings.

9.11 Given a cash sale, ring it up properly on a cash register.

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LESSON PLAN #2

Time for Lesson: 55 minutes

Objectives: After completion of this lesson, students should be able to:

9.02 Round off whole numbers to the nearest ten, hundred and thousand.
9.03 Multiply decimals and locate the decimal point correctly in the answers.
9.04 Convert whole numbers to percents.

Resources:

1. Information Sheet 2.01 - Rounding Numbers
2. Information Sheet 2.02 - Multiplying Decimals
3. Information Sheet 2.03 - Converting Whole Numbers to Percents
4. Assignment Sheet 2.01 - Rounding Numbers
5. Assignment Sheet 2.02 - Multiplying Decimals
6. Assignment Sheet 2.03 - Converting Whole Numbers to Percents

Teacher Activities:

1. Inform class about the objectives to be covered in this lesson.

2. Distribute Information Sheet 2.01 - Round Numbers and discuss with students after reading.

3. Distribute Assignment Sheet 2.01 - Rounding Numbers and stress that the goal is 100% accuracy. These may be collected for a grade if teacher desires.

4. Distribute Information Sheet 2.02 - Multiplying Decimals and discuss.

5. Give students Assignment Sheet 2.02 - Multiplying Decimals. May be used in the same manner as Assignment Sheet 2.01.

6. Distribute Information Sheet 2.03 - Converting Whole Numbers to Percents and discuss.

7. Give students Assignment Sheet 2.03 - Converting Whole Numbers to Percents. May be used in the same manner as Assignment Sheet 2.01.

Student Activities:

1. Discuss enabling objectives 9.02, 9.03 and 9.04 with teacher.
2. Read Information Sheet 2.01 - Rounding Numbers and ask questions.
3. Complete Assignment Sheet 2.01 - Rounding Numbers.
4. Read Information Sheet 2.02 - Multiplying Decimals and discuss.
5. Complete Assignment Sheet 2.02 - Multiplying Decimals.
6. Read Information Sheet 2.03 - Converting Whole Numbers to Percents.
7. Complete Assignment Sheet 2.03 - Converting Whole Numbers to Percents.

Assignment: Students are to bring a check stub from one of their recent checks (if this is a coop class) to the next class meeting.

INFORMATION SHEET 2.01

Rounding Numbers

When the final result of a problem is in dollars and cents, the amount is usually rounded to a whole number of cents. For example, \$15.06 x 5.25 = \$79.065 would be rounded up to \$79.07. The method of rounding varies in business. In some situations the amount is rounded to the nearest cent. In others, any fraction is treated as an additional cent.

To round off to the nearest cent, drop the digits to the right of the cents place. If the first digit to the right of the cents place was 5 or more, add one to the cents digit. Thus:

\$79.065 = \$79.07
\$43.9886 = \$43.99
\$85.6349 = \$85.63

The same principle may be applied in cases where a number is to be rounded to the nearest hundred, thousand, or any other specified place. Thus, 38,276 rounded to the nearest hundred is 38,300; and to the nearest thousand, it is 38,000.

Similarly, 8.9637 rounded to the nearest tenth is 9.0; to the nearest hundredth, it is 8.96; to the nearest thousandth, it is 8.964.

INFORMATION SHEET 2.02

Multiplying Decimals

Multiplying decimals is handled exactly as any other multiplication with one exception. The decimal point is placed in the product by pointing off from the right as many decimal places as there are in the multiplicand and multiplier.

In the following example, there are 2 places in both the multiplicand and the multiplier; and therefore, 4 places in the product.

EXAMPLE: Find the cost of 5.25 cartons of tile at $15.06 a carton.

SAMPLE:

$$\begin{array}{r} \$15.06 \\ \times\ 5.25 \\ \hline 7530 \\ 3012 \\ 7530 \\ \hline \$79.0650 \end{array}$$

The product $79.0650 must now be rounded off. Since the first digit to the right of the cents is 5, the correct answer is $79.07.

INFORMATION SHEET 2.03

Converting Whole Numbers to Percents

The rule for changing a whole number to a percent is very simple:

Move the decimal point 2 places to the right and add a percent sign.

.80 = 80%
.625 = 62.5%
1.22 = 122%
.2 = 20%
9.50 = 950%
.9 = 90%
.25 = 25%

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ASSIGNMENT SHEET 2.01

Rounding Numbers

Round each of the following as indicated to the:

A. Nearest cent:

1. $ 6.1493 _____
2. $ 9.5649 _____
3. $23.2953 _____
4. $50.9961 _____

B. Nearest tenth of a dollar:

1. $ .0763 _____
2. $ .0776 _____
3. $ .2085 _____

C. Nearest tenth:

1. 9.726 _____
2. 6.362 _____
3. 8.953 _____

D. Nearest hundredth:

1. 2.417 _____
2. .3973 _____
3. .006 _____

E. Nearest hundredth of a cent:

1. 4.56¢ _____
2. 2.97¢ _____
3. 19.95¢ _____
4. 20.949¢ _____

F. Nearest cent:

1. $8.524 _____
2. $3.586 _____
3. $7.398 _____
4. $9.499 _____

G. Nearest thousandth:

1. 65.7894 _____
2. 4.6299 _____
3. 84.763 _____

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ASSIGNMENT SHEET 2.01 KEY

A. 1. $ 6.15
2. $ 9.56
3. $23.30
4. $51.00

B. 1. $ .10
2. $ .10
3. $ .20

C. 1. 9.7
2. 6.4
3. 9.0

D. 1. 2.42
2. .40
3. .01

E. 1. 4.56¢
2. 2.97¢
3. 19.95¢
4. 20.95¢

F. 1. $8.52
2. $3.59
3. $7.40
4. $9.50

G. 1. 65.789
2. 4.630
3. 84.763

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ASSIGNMENT SHEET 2.02

Multiplying Decimals

Solve the following problems. Round answers in dollars and cents to the nearest whole cent.

1. 2.63 x 403 = _____
2. 12.7 x 3.22 = _____
3. 24.6 x 40.8 = _____
4. 70.4 x 1.65 = _____
5. 79.8 x 69.25 = _____
6. 3.6 x $4.35 = _____
7. 6.5 x $33.22 = _____
8. 2.4 x $86.55 = _____
9. 8.33 x $21.50 = _____
10. 5.15 x $5.00 = _____

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ASSIGNMENT SHEET 2.02 KEY

1. 1059.89
2. 40.894
3. 1003.68
4. 116.16
5. 5526.15
6. $15.66
7. $215.93
8. $207.72
9. $179.10
10. $25.75

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ASSIGNMENT SHEET 2.03

Converting Whole Numbers to Percents

Express each of the following as a percent.

1. .46 _____
2. .08 _____
3. .01 _____
4. .70 _____
5. .1 _____
6. .5 _____
7. .235 _____
8. .079 _____
9. .0036 _____
10. .12 _____
11. .37 _____
12. 3.41 _____
13. 4.56 _____
14. 2.20 _____
15. 1.00 _____
16. 4 _____
17. 1 _____
18. 3 _____

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ASSIGNMENT SHEET 2.03 KEY

1. 46%
2. 8%
3. 1%
4. 70%
5. 10%
6. 50%
7. 23.5%
8. 7.9%
9. .36%
10. 12%
11. 37%
12. 341%
13. 456%
14. 220%
15. 100%
16. 400%
17. 100%
18. 300%

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LESSON PLAN #3

Time for Lesson: 55 minutes

Objective: After completion of this lesson, students should be able to:

9.05 Figure a salary given the number of hours worked and the rate per hour.

Resources:

1. Information Sheet 3.01 - Wage Income
2. Information Sheet 3.02 - Wage Deduction
3. Assignment Sheet 3.01 - Hourly Wage
4. Assignment Sheet 3.02 - Wage Deduction

Teacher Activities:

1. Distribute Information Sheet 3.01 - Wage Income; allow a few minutes for reading and then discuss the points covered. Give ample time to the example.

2. Give students Assignment Sheet 3.01 - Hourly Wage. May be used for grading if desired.

3. Discuss answers and any questions students may have.

4. Distribute Information Sheet 3.02 - Wage Deduction. Read and discuss. Ask students to identify the kinds of deductions from *their* pay (if this is a coop class). Ask students for examples of other deductions.

5. Hand out Assignment Sheet 3.02 - Wage Deduction. May be used as practice or as a basis of a grade.

Student Activities:

1. Bring check stub to class (if coop).
2. Discuss Information Sheets 3.01 - Wage Income and 3.02 - Wage Deduction. Ask questions.
3. Complete Assignment Sheets 3.01 - Hourly Wage and 3.02 - Wage Deduction.

Assignment: None.

INFORMATION SHEET 3.01

Wage Income

The principal income of many people in retail business is the weekly wage they receive for their work. Usually, they are paid for the number of hours worked or a commission.

When employees work on an hour-rate basis, they are paid a definite amount for each hour they work. For example, if an employee worked 40 hours during one week at a rate of $2.00 an hour, his or her earnings for the week would be $80.00.

EXAMPLE: 40 x $2 = $80.00

The number of hours worked in a regular day or week is called overtime and the rate of pay is usually one and one-half times that of the regular rate. This is commonly called time and a half.

In some businesses double time is paid for work on Sundays and holidays. When time and a half is paid for overtime, wages are calculated in the following manner.

1. Multiply the regular rate by 1.5 to find the overtime rate. Do not round the result.
2. Multiply the overtime rate by the number of overtime hours.
3. Add the regular-time wages to the overtime wages to obtain the total wages received.

EXAMPLE:

Bob receives $2.40 an hour for regular hours. Overtime is paid at the rate of 1½. Last week he worked 45 hours. His total wages for the week would be:

Regular time:

40 x $2.40 = $96.00

Overtime:

$2.40 regular rate
x 1.5 overtime
$3.60 overtime rate
x 5 hours overtime
$18.00 overtime wages

Total Wages:

$96.00 regular
+ 18.00 overtime
$114.00 total

INFORMATION SHEET 3.02

Wage Deduction

Most wage earners have deductions from their wages. These deductions are amounts withheld by the employer for the employee.

Income tax is one amount that is usually required to be withheld by the government. The federal government has income tax and there may be state income taxes. Social security is another tax that is required by the federal government. There may also be other amounts taken from an employee's wage if he or she requests them. For example, U. S. Savings Bonds may usually be purchased this way.

After the total wages are determined the deductions are subtracted to arrive at the net pay or pay check amount.

For example, Bonnie Smith worked 40 hours at $3.00 per hour last week. Her gross (or total pay before deductions) would therefore be:

40 x $3.00 = $120.00

The federal government requires her employer to withhold $20.50 for federal income tax and 5.85% of her gross pay for social security taxes. There are no other deductions. How much would Bonnie's net pay be?

SOLUTION:

GROSS PAY		$120.00
Less Deductions:		
Income tax	= $20.50	
Social Security ($120.00 x .0585	= $ 7.02)	
Total Deductions	$27.52	- 27.52
NET PAY		$ 92.48

MATHEMATICS

ASSIGNMENT SHEET 3.01

Hourly Wages

1. Find the overtime rate for each of the regular-time rates below. Time and a half is paid for overtime.

	Regular rate	Overtime rate
A.	$1.80	_____
B.	$2.32	_____
C.	$1.94	_____
D.	$1.85	_____
E.	$2.33	_____
F.	$3.27	_____

2. The Air Corporation pays its employees on a 40-hour week basis with time and a half for overtime. Find the total wages for each of the following employees.

	Name	Hour rate	Hours	Wages
A.	Joe James	$2.50	42	_____
B.	Kevin Loos	$2.60	46	_____
C.	Sherri Leimer	$2.70	48	_____
D.	John Elias	$2.80	43	_____

3. Workers at J. C. Nickels are paid on an 8-hour day basis with time and a half paid for all over 8 hours *a day*. The following table lists 3 employees with hours worked each day last week. Complete the table.

Name	Hours Worked					Hourly Rate	Total Hours	Total Wages
	M	T	W	TH	F			
A. Ray Bovinett	8	6	8	9	9	2.40		
B. Bill Kesterson	9	10	7	8	8	2.50		
C. Lou Irwin	8	9	9	8	10	2.80		

MATHEMATICS

ASSIGNMENT SHEET 3.01 KEY

1. A. 2.70
   B. 3.48
   C. 2.91
   D. 2.78
   E. 3.50
   F. 4.91

2. A. 107.50
   B. 127.40
   C. 140.40
   D. 124.60

3. A. 98.40
   B. 108.75
   C. 128.80

MATHEMATICS

ASSIGNMENT SHEET 3.02

Wage Deduction

1. Jim Crock worked 45 hours last week with 40 hours of this at a regular rate of $3.60 per hour. His overtime rate is figured at time and a half. His employer withheld 5.85% of his wages for social security and $18.50 for federal income tax. Figure!

   A. Regular wages = _____

   B. OT wages = _____

   C. Total wages = _____

   D. Social security = _____

   E. Net pay = _____

2. Susan Flowers worked 42 hours this week and was paid for 40 hours at regular time at a rate of $2.00 per hour with 2 hours overtime at double the regular rate. Her boss withheld $16.00 income tax, and 5.85% of her total earnings for social security. In addition, Susan has asked her boss to withhold $5.00 each week for savings bond. How much is each of the following?

   A. Regular wages = _____

   B. OT wages = _____

   C. Total wages = _____

   D. Social security = _____

   E. Net pay = _____

MATHEMATICS

ASSIGNMENT SHEET 3.02 KEY

1. A. $144.00
   B. $ 27.00
   C. $171.00
   D. $ 10.00
   E. $142.50

2. A. $80.00
   B. $ 8.00
   C. $88.00
   D. $ 5.15
   E. $61.85

MATHEMATICS

LESSON PLAN #4

Time for Lesson: 55 minutes

Objective: After completion of this lesson, students should be able to:

9.06 Figure a salary when on a fixed rate plus commission earned during the pay period.

Resources:

1. Information Sheet 4.01 - Commissions
2. Assignment Sheet 4.01 - Commissions

Teacher Activities:

1. Distribute Information Sheet 4.01 - Commissions, and allow a few minutes of class time to read.
2. Discuss Information Sheet 4.01 with students, stressing that the commission is very common in selling.
3. Distribute Assignment Sheet 4.01 - Commissions, and allow time to complete. May be used for a grade.

Student Activities:

1. Read Information Sheet 4.01 - Commissions and discuss.
2. Complete Assignment Sheet 4.01 - Commissions.

Optional Activities: The DECA Chapter Sales Activity may incorporate a commission plan for the student salesperson.

INFORMATION SHEET 4.01

Commissions

In many types of business, a salesperson is paid a commission on sales instead of a fixed salary or is paid a combination salary and commission. The commission is usually stated as a percent of the salesperson's total sales or the amount of sales in excess of a specified quota. For example, Evan White, a traveling sales representative, receives a salary of $600 a month and a commission of 15% on monthly sales in excess of $4,000. As his last month's sales were $7,200, his commission for the month was .15 x ($7,200 - $4,000) = .15 x $3,200 = $480. His total earnings for the month were $600 + $480 = $1,080.

In some instances a salesperson may receive graduated commissions; that is, commissions that vary in rate according to the volume of sales, with the rate increasing as the sales increase. For example, Marsha Well obtains the agency for sets of encyclopedias. The commission is to be figured each month on the number of sets sold, as follows: $18 each for the first 25 sets; $22 each for the second 25 or part thereof; and $26 each for all over 50 sets sold each month. In September she sold 48 sets and in October, 61. Her total commission for the two months was $2,242, as follows.

SOLUTION:

25 x $18 = $450
25 x $22 = $550
11 x $26 = $286

$450 + $550 + $286 = $1,286 commission for October

$956 + $1,286 = $2,242 commission for the two months.

MATHEMATICS

ASSIGNMENT SHEET 4.01

Commissions

1. On a busy day Kyle Marshall, an auto sales representative working on a straight commission basis, sold 3 used cars at $825 each. His commission was 6%. His earnings were $_____.

2. Selma Rossi receives a weekly salary of $75 plus a commission of 1% on all sales. Her sales for the last four weeks are shown below. List (a) her commission for each week, (b) her total earnings for each week, (c) her total sales, total commission, total salary and total earnings for the four weeks.

Week	Sales	Commission	Salary	Total Earnings
1	$1,175		$75	
2	$1,570		$75	
3	$1,290		$75	
4	$1,382		$75	
Total				

3. Harold Cornell sells two types of vacuum cleaners on a straight commission basis. On one retailing for $89 he receives a commission of 20%. On the other, selling for $114, he receives 25%. Last week he sold 5 of the $89 cleaners and 3 of the $114 cleaners. His total earnings for the week were $_____.

4. Henry Sawyer, a salesman, received a salary of $125 a week plus 3/4% commission on weekly sales in excess of $12,500. As his sales last week totaled $18,560, his total earnings for the week were $_____.

5. The Maxwell Company pays its salespersons 5% commission on all sales and an additional 3% commission on all monthly sales in excess of $8,000. In April Alton Drew, one of the salespersons, sold goods amounting to $14,000. His commission for the month was $_____.

6. In May Alton Drew sold goods amounting to $12,350. (a) His May commission was $_____. (b) This was _____% less than his commission for April. (See #5 on the previous page.)

7. Rita Duncan, a sales representative, has offers of employment from two firms. The Cory Company offers her a salary of $550 a month, a 2% commission on total monthly sales, and an additional 3% on monthly sales in excess of $7,000. The Gould Company offers her a commission of 6% on the first $2,000 of monthly sales, 8% on the next $2,000 of monthly sales, and 10% on all monthly sales in excess of $4,000. On sales averaging $12,000 a month, she would earn (a) $_____ more per month by accepting the position in the (b) _____ Company.

MATHEMATICS

ASSIGNMENT SHEET 4.01 KEY

1. $148.50

2.

Week	Sales	Commission	Salary	Total Earnings
1	$1,175	(a) $11.75	$75	(b) $ 86.75
2	$1,570	(a) $15.70	$75	(b) $ 90.70
3	$1,290	(a) $12.90	$75	(b) $ 87.90
4	$1,382	(a) $13.82	$75	(b) $ 88.82
Total	(c) $5,417	(c) $54.17	(c) $300	(c) $354.17

3. $174.50

4. $170.45

5. $880

6. (a) $748
   (b) 15%

7. (a) $140
   (b) Gould

MATHEMATICS

LESSON PLAN #5

Time for Lesson: 55 minutes

Objective: After completion of this lesson, students should be able to:

9.07 Figure the sales tax on an item when given the purchase price and the tax rate.

Resources:

1. Information Sheet 5.01 - Sales Tax
2. Assignment Sheet 5.01 - Sales Tax Problems
3. Current Tax Table (obtained from employer)

Teacher Activities:

1. Distribute Information Sheet 5.01 - Sales Tax. Allow a few minutes to read.

2. Explain the use of a sales tax chart using Tax Table.

3. Calling on class members at random, ask for the amount of tax on a few purchases, i.e., a soda at 50¢, a ball point pen at 89¢, a pair of gloves at $2.00, etc. Try to get a response from each member of the class at least one time around. This should take 15-30 minutes.

4. Distribute Assignment Sheet 5.01 - Sales Tax Problems and allow adequate time for completion.

Student Activities:

1. Discuss Information Sheet 5.01 - Sales Tax.
2. Complete Assignment Sheet 5.01 - Sales Tax Problems.

Assignment: None

INFORMATION SHEET 5.01

Sales Tax

Most cities and states levy a sales tax. The tax is usually collected from the purchaser at the time of the sale and passed on to the proper tax official. The sales tax is generally figured as a percent of sales; i.e., a 3% or 5% sales tax. If a sale amounted to $5.00 and the state sales tax was 3%, the amount of the tax to be added to the purchase price would be 15¢.

$5.00 x .03 = $ .15

Usually, the business will provide a sales tax chart for the salesperson and this chart is attached to, or placed near, the cash register.

MATHEMATICS

ASSIGNMENT SHEET 5.01

Sales Tax Problems

Using the sales tax chart, find the amount of sales tax to be added to the following purchases.

	Amount of Sale	Amount of Sale With Tax
1.	$ .36	_____
2.	$1.36	_____
3.	$2.36	_____
4.	$ .82	_____
5.	$2.82	_____
6.	$ .67	_____
7.	$1.67	_____
8.	$3.15	_____
9.	$5.50	_____
10.	$3.70	_____

11. Find the tax on a pair of shoes costing $21.49. _____

12. Bob sold 2 tennis balls @3 for a $1.00, a pair of socks for $1.49, a bag @7.50, and a shirt for $14.95.

    a. Total the sale: _____

    b. Using the sales tax table, find the amount of tax on this sale: _____

    c. Total sale including tax: _____

MATHEMATICS

ASSIGNMENT SHEET 5.01 KEY

1. $ .38
2. $1.42
3. $2.46
4. $ .86
5. $2.94
6. $ .70
7. $1.74
8. $3.28
9. $5.73
10. $3.86
11. $ .89
12. a. $24.61
    b. $ 1.02
    c. $25.63

MATHEMATICS

LESSON PLAN #6

Time for Lesson: 55 minutes

Objective: After completion of this lesson, students should be able to:

9.08 Correctly compute discounts when given the price of an item and percent of discount.

Resources:

1. Information Sheet 6.01 - Discounts
2. Assignment Sheet 6.01 - Discounts

Teacher Activities:

1. Distribute Information Sheet 6.01 - Discounts and discuss with class.

2. Some students will have experience with employee discounts as well as the ones listed on the information sheet. Ask for discussion of these.

3. Distribute Assignment Sheet 6.01 - Discounts and allow time to complete.

Student Activities:

1. Read and discuss Information Sheet 6.01 - Discounts.
2. Discuss employee discounts.
3. Complete Assignment Sheet 6.01 - Discounts.

INFORMATION SHEET 6.01

Discounts

Discounts are very common in business and are important to most store owners. As a matter of fact, some stores' net profits at the end of the year amount to no more than the amount of discounts they have taken during the year.

There are a number of different types of discounts and you will become acquainted with three of them in this unit.

Cash Discounts: Offered as a inducement to the buyer to pay in advance of the due date. Usually, when goods are shipped, an invoice is mailed to the buyer at the same time. Normally, 30 days are given to pay the invoice, but if the buyer will pay within 10 days of the invoice date, he or she will receive a discount of 2% or 3%. Thus, if goods amounting to $100 are shipped on April 1, and the invoice due in 30 days with a 2% discount is mailed the same day, if paid within 10 days, the buyer must deduct $2 if he or she pays the invoice by April 10.

Trade Discounts: A method of quoting prices based on list prices. This type is usually used between businesses. Retailers are granted a stated trade discount where it is customary for a manufacturer to quote prices that are approximate retail prices. For example, suppose a manufacturer is trying to sell a Janus watch to jewelers. The watch normally sells for $160 to retail customers. The manufacturer may offer the watches to a jeweler at a trade discount of 50%. The jeweler's cost then would be $80.

Chain Discounts: When manufacturers have several hundred items in their line, they may have a catalog printed and sent to their customers. Since it is costly to print the catalog, they may print the usual retail price, then offer a series of trade discounts. If at any time in the future they want to change their price it is easy to inform their customers of the change in the chain discount. This is much less costly than printing a new catalog.

EXAMPLE:

A large manufacturer lists the retail price of a power saw in their catalog at $40. The chain discount to retailers is 20-10%. The retailer, to find his or her price from the manufacturer, would deduct 20% and 10% as follows:

STEP I	$40 x .20	= $8
	$40 - $8	= $32
STEP II	$32 x .10	= $3.20
	$32 - $3.20	= $28.20

Thus, the retailer would pay $28.80. Note that the second discount is not based on the original price of $40.

MATHEMATICS

ASSIGNMENT SHEET 6.01

Discounts

1. The Benson Department Store received a shipment of clothing with an invoice dated September 8. The total amount was $1,820 with terms 2/10 net 30.

   A. When is the net amount due? _____

   B. When would the invoice have to be paid in order to receive the discount? _____

   C. How much could be deducted if paid by that date? _____

2. The employees of Smith Jewelers, Inc. receive a 10% discount on merchandise they buy from the store. Mary Jones bought a watch retailing for $59.00. How much would she have to pay for it? _____

3. Sander Hardware wants to order 10 chain saws listed in a manufacturer's catalog. The retail price listed is $190 each with a trade discount of 20%, 10% and 5%.

   A. What is the dealer's price for 1 saw? _____

   B. How much would 10 cost? _____

4. Craft Home Furnishings can buy TV sets from several major wholesalers. They want to buy 10 at the lowest possible price. Figure the two following deals:

   A. St. Louis Wholesalers, Inc. offers brand A, which retails for $400 at a trade discount of 30% plus another 5% when 5 or more are purchased on one order. What would be the net cost? _____

   B. Chicago Wholesalers, Inc. offers the same brand. However, the discount is 25% and 1 free set is given with the purchase of 9 sets. What would be the net cost? _____

   Which deal offers the lower net cost? _____

ASSIGNMENT SHEET 6.01 KEY

1. A. October 8
   B. September 18
   C. $36.40

2. $53.10

3. A. $129.96
   B. $1,299.60

4. A. $2,660.00
   B. $2,700.00

   Deal "A" is better (lower).

MATHEMATICS

LESSON PLAN #7

Time for Lesson: 55 minutes

Objective: After completion of this lesson, students should be able to compute math problems dealing with addition, subtraction, division, multiplication, figuring percents and discounts, and calculating salary as the problems relate to the students' chosen occupation.

Resources:

1. Post-assessment
2. Post-assessment key

Teacher Activities:

1. Distribute post-assessment to the students.
2. Explain to the students they have the class period to complete the assessment and turn it in.

Student Activities: Complete the assessment and turn it in to your instructor.

Assignment: None

MATHEMATICS

POST-ASSESSMENT

1. Complete the following:

   A. $295.00 + $30 + $48.06 = _____

   B. 328.6 - 179.3 = _____

   C. 360 x 14.6 = _____

   D. 650 ÷ 8.2 = _____

2. Barbara Miller purchased 3 dozen buttons at 40¢ a dozen, 1 pattern priced at 2 for $1.79 and 3 yards of cloth at $3.00 a yard. What is the total cost? _____

3. Round 56.6384 to the nearest:

   A. Tenth _____

   B. Hundredth _____

   C. Thousandth _____

4. If you could buy 2 cans of corn for 89¢, what would 1 can sell for? _____

5. Betty Blue worked 40 hours last week at $4.80 per hour. What was her total pay for the week? _____

6. Don White is paid $3.50 an hour for regular time with time and a half paid for all over 40 hours. Last week he worked 44 hours. Figure his total earnings for the week. _____

7. Employees of the Gray Clothing Store are paid a salary of $80 per week plus 5% of their sales. One person sold $1,200 worth of goods last week. What would be that person's total pay? _____

8. The So-Good Soft Drink salespersons are paid a weekly salary of $120 or 5¢ per case sold each week, whichever is the greater amount. If Bob Banks sold 2,300 cases last week, how much was his pay? _____

9. If the state sales tax is 4%, how much tax would be due on an automobile that sells for $6,500? _____

10. Jack sold a pair of slacks at $14.95, a shirt for $12 and a belt for $4.50 to a customer. How much tax would the customer owe at 5%? _____

11. The Yellow Bird Grocery Store received an invoice for $650.00 dated January 28, terms 3/10 net 60.

    A. When is the total due? _____

    B. When would the invoice have to be paid to take the discount? _____

    C. What is the amount of the discount? _____

12. If the trade discount is 20%, 15%, 5%, what would be the dealer's price of a piano listing for $2,000? _____

MATHEMATICS

POST-ASSESSMENT KEY

1. A. $373.06
   B. 149.30
   C. 5256
   D. 79.27

2. $11.10

3. A. 56.6
   B. 56.64
   C. 56.638

4. 45¢

5. $192.00

6. $161.00

7. $140.00

8. $120.00

9. $260.00

10. $1.57

11. A. March 29
    B. February 7
    C. $19.50

12. $1,292

MATHEMATICS

LESSON PLAN #8

Time for Lesson: 55 minutes

Objective: After the student has completed this unit he or she will be able to compute math problems dealing with addition, subtraction, division, multiplication, figuring percents and discounts, and calculating salary as the problems relate to the student's chosen occupation.

Resource: Unit Evaluation

Teacher Activities:

1. Contact several employers that serve as training stations and explain how you need their cooperation for this unit evaluation.

2. Secure a commitment of cooperation from several of the employers and set up a date for the evaluation.

3. Make necessary arrangements for students to get to the employer's place of business on the day of the evaluation.

4. Administer the unit evaluation to the students.

Student Activities: Complete the unit evaluation.

Assignment: None

UNIT EVALUATION

1. The cooperation of several local businesses will help in this evaluation. Any type of retail business such as grocery, specialty, hardware, clothing, etc. can be used. Each student in the cooperative program is given a list of items to purchase from a cooperating store. The items should include a variety of prices. The student should figure the total of his or her purchase including sales tax before reaching the checkout point. The business should be previously instructed to arrive at an incorrect total. This will test the student's confidence. The student should pay with a theoretical amount such as a $20 bill and know how much change she or he is to receive.

2. A student in a non-cooperative program could be evaluated in the classroom following a similar procedure.

3. Again the cooperation of local business will help in this situation. Ask the students to figure the pay of an employee paid on salary or commission in a local grocery, jewelry, clothing, shoe store, etc.